

INPUT

| parameter | conditions/description | min | typ | max | units |
|------------------|-------------------------|------|--------|--------|-------|
| input voltage | 12 Vdc input models | 9 | 12 | 18 | Vdc |
| | 24 Vdc input models | 18 | 24 | 36 | Vdc |
| start-up voltage | 12 Vdc input models | | | 9 | Vdc |
| | 24 Vdc input models | | | 18 | Vdc |
| surge voltage | for maximum of 1 second | | | | |
| | 12 Vdc input models | -0.7 | | 25 | Vdc |
| | 24 Vdc input models | -0.7 | | 50 | Vdc |
| filter | capacitance filter | | | | |
| current | 12 Vdc input models | | 321/30 | 338/50 | mA |
| | 24 Vdc input models | | 156/20 | 165/40 | mA |

OUTPUT

| parameter | conditions/description | min | typ | max | units |
|-------------------------|--------------------------|-----|------|-------|-------|
| line regulation | min to max Vin | | ±0.2 | ±0.5 | % |
| load regulation | 5% ~ 100% load | | ±0.5 | ±1 | % |
| set-point accuracy | 5% ~ 100% load | | | | |
| | positive outputs | | ±1 | ±3 | % |
| | negative outputs | | ±3 | ±5 | % |
| switching frequency | full load, nominal input | | 300 | | kHz |
| transient response | 25% load step change | | ±2.5 | ±5 | % |
| temperature coefficient | full load | | | ±0.03 | %/°C |

PROTECTIONS

| parameter | conditions/description | min | typ | max | units |
|--------------------------|---------------------------|-----|-----|-----|-------|
| short circuit protection | continuous, self-recovery | | | | |

SAFETY AND COMPLIANCE

| parameter | conditions/description | min | typ | max | units |
|-----------------------|---------------------------------------------------------------------------------|------|-----|-----|--------|
| isolation voltage | input-output electric strength test for 1 minute | 1500 | | | Vdc |
| isolation resistance | input-output insulation at 500 Vdc | 1000 | | | MΩ |
| isolation capacitance | input-output capacitance at 100 KHz / 0.1 V | | 100 | | pF |
| safety approvals | designed to meet 62368: EN, BS EN | | | | |
| EMC | CISPR32/EN55032 Class B (see recommended circuits) | | | | |
| ESD | IEC/EN61000-4-2, Contact ±6K, perf. Criteria B | | | | |
| radiated immunity | CISPR32/EN55032 | | | | |
| EFT/burst | IEC/EN61000-4-4, ±2KV, perf. Criteria B (see recommended circuits) | | | | |
| surge | IEC/EN61000-4-5, line to line ±2KV, perf. Criteria B (see recommended circuits) | | | | |
| conducted immunity | IEC/EN61000-4-6 3 Vrms | | | | |
| RoHS | yes | | | | |
| MTBF | MIL-HDBK-217F @ 25°C | 1000 | | | kHours |

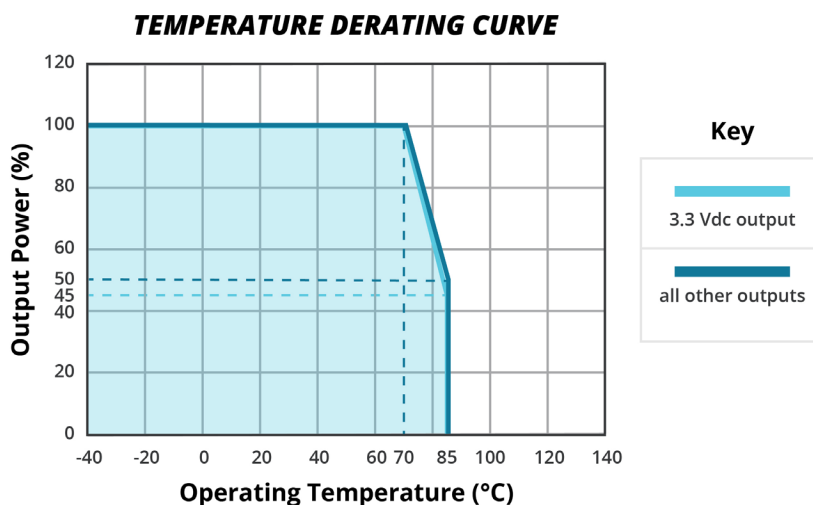
ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | | -40 | | 85 | °C |
| storage temperature | | -55 | | 125 | °C |
| humidity | non-condensing | 5 | | 95 | % |

SOLDERABILITY

| parameter | conditions/description | min | typ | max | units |
|------------------|---------------------------------|-----|-----|-----|-------|
| hand soldering | 1.5 mm from case for 10 seconds | | | 300 | °C |
| reflow soldering | 60 s max | | | 245 | °C |

DERATING CURVE



MECHANICAL

| parameter | conditions/description | min | typ | max | units |
|---------------|-------------------------------------------------------------|-----|-----|-----|-------|
| dimensions | 14 x 14 x 9 | | | | mm |
| case material | Black plastic; flame-retardant and heat-resistant (UL94-V0) | | | | |
| weight | | | 2.2 | | g |

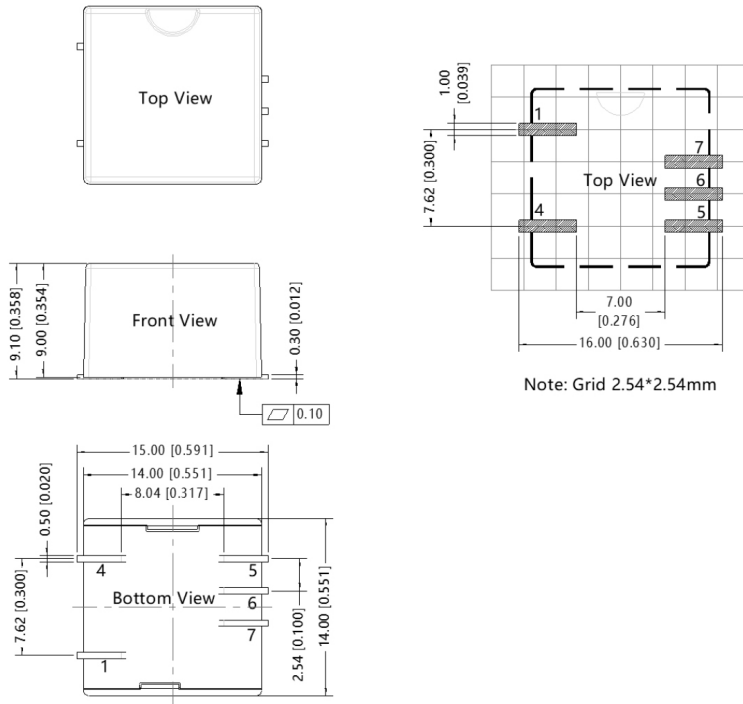
MECHANICAL DRAWING

units: mm [inches]

pin diameter tolerance: ± 0.10 [± 0.004]

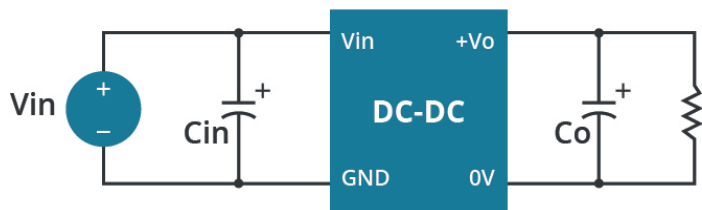
tolerance: ± 0.50 [± 0.020]

| PIN CONNECTIONS | | |
|-----------------|--------|------|
| PIN | Single | Dual |
| 1 | GND | GND |
| 4 | Vin | Vin |
| 5 | +Vo | +Vo |
| 6 | NC | 0V |
| 7 | 0V | -Vo |



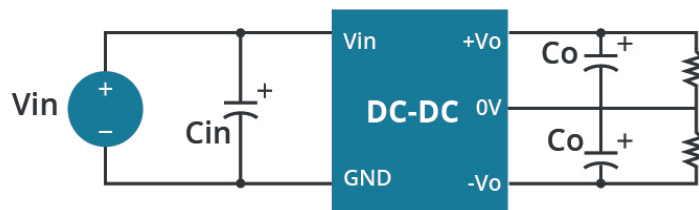
RECOMMENDED CIRCUITS

Figure 1
Single output



| Parameter Description | | |
|-----------------------|------------|------------|
| Vin (Vdc) | 12 | 24 |
| Cin | 47uF/25V | 47uF/50V |
| Vo (Vdc) | 3.3, 5 | 12, 15, 24 |
| Co | 100uF/6.3V | 27uF/35V |

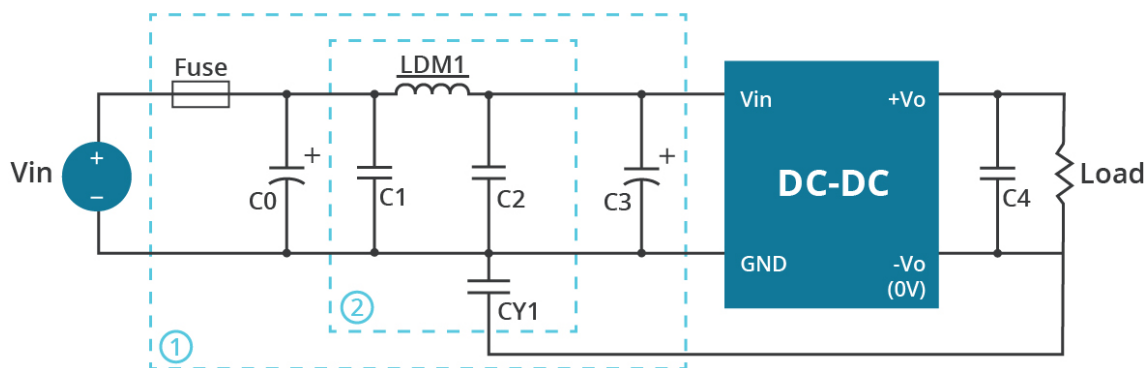
Figure 2
Dual output



| Parameter Description | | |
|-----------------------|----------|----------|
| Vin (Vdc) | 12 | 24 |
| Cin | 47uF/50V | |
| Vo (Vdc) | 5, 9 | 12, 15 |
| Co | 47uF/16V | 10uF/25V |

EMC COMPLIANCE CIRCUITS

Figure 3
Single output

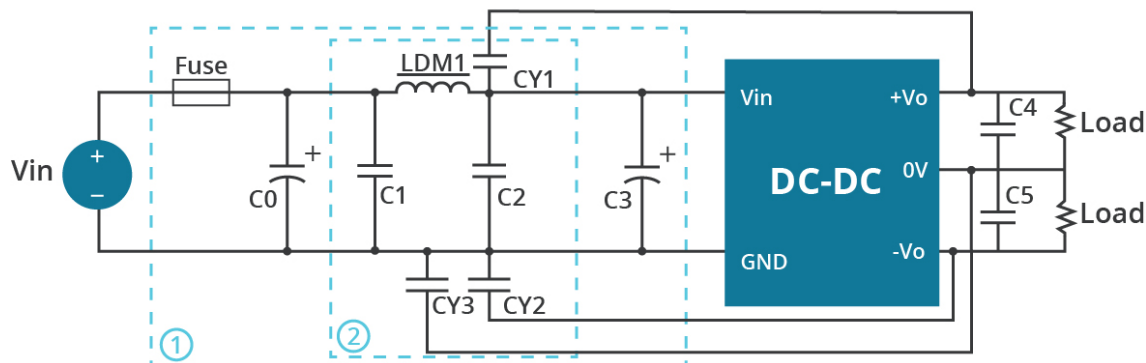


| Parameter Description | | | | | | | | | | |
|-----------------------|-----------------------------------------------------|---|-----------|----|----|-------------|---|-----------|----|----|
| Part No. | Vin: 12 Vdc | | | | | Vin: 24 Vdc | | | | |
| Vo (Vdc) | 3.3 | 5 | 12 | 15 | 24 | 3.3 | 5 | 12 | 15 | 24 |
| FUSE | slow blow, choose according to actual input current | | | | | | | | | |
| C0 | 1000µF/25V | | | | | 680µF/50V | | | | |
| C1 | 10µF/50V | | 4.7µF/50V | | | 10µF/50V | | 4.7µF/50V | | |
| LDM1 | 15µH | | | | | | | | | |
| C2 | 4.7µF/50V | | | | | | | | | |
| C3 | 330µF/50V | | | | | | | | | |
| CY1 | 1nF/2KV | | | | | | | | | |
| C4 | Refer to the Cout Fig.2 | | | | | | | | | |

Note: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

EMC COMPLIANCE CIRCUITS (CONTINUED)

Figure 4
Dual output



| Parameter Description | | | |
|-----------------------|-----------------------------------------------------|-----------|------------------|
| Part No. | Vin: 12 Vdc | | Vin: 24 Vdc |
| Vo (Vdc) | ±5, ±9, ±12 | ±15 | ±5, ±9, ±12, ±15 |
| FUSE | slow blow, choose according to actual input current | | |
| C0 | 1000µF/25V | | 680µF/50V |
| C1 | 4.7µF/50V | | |
| LDM1 | 10µH | | |
| C2 | 10µF/50V | | |
| C3 | 330µF/50V | | |
| CY1 | 1nF/2KV | 470pF/2KV | 1nF/2KV |
| CY2 | 1nF/2KV | 470pF/2KV | 1nF/2KV |
| CY3 | 1nF/2KV | 470pF/2KV | / |
| C4,C5 | Refer to the Cout Fig.3 | | |

Note: For EMC tests we use Part ① in Fig. 4 for immunity and part ② for emissions test. Selecting based on needs.

REVISION HISTORY

| rev. | description | date |
|------|--------------------------------------------|------------|
| 1.0 | initial release | 03/28/2020 |
| 1.01 | tolerance update to page 4 | 06/09/2020 |
| 1.02 | derating curve and circuit figures updated | 07/15/2021 |
| 1.03 | CE certification removed | 11/22/2022 |
| 1.04 | dual output circuits added | 05/31/2023 |

The revision history provided is for informational purposes only and is believed to be accurate.



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